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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/766,872	01/30/2004	Jeffrey T. Wetzel	247562US6YA	4092
22850	7590	08/05/2005	EXAMINER	
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			WARREN, MATTHEW E	
			ART UNIT	PAPER NUMBER
			2815	

DATE MAILED: 08/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

<b>Office Action Summary</b>	Application No.		Applicant(s)	
	10/766,872		WETZEL ET AL.	
	Examiner		Art Unit	
	Matthew E. Warren		2815	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 21 April 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) 20-36 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

### **DETAILED ACTION**

This Office Action is in response to the Election filed on April 21, 2005.

#### ***Election/Restrictions***

Applicant's election with traverse of Group I, claims 1-19 in the reply filed on April 21, 2005 is acknowledged. The traversal is on the ground(s) that examination of both inventions would not place a serious burden on the examiner. This is not found persuasive because the two inventions are classified in two separate subclasses. An examiner who specializes in one subclass would find it difficult to conduct a thorough search of another subclass. A burden is placed on the examiner in such a situation. The requirement is still deemed proper and is therefore made FINAL.

Claims 20-36 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim.

#### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 2, 11, and 13-19 are rejected under 35 U.S.C. 102(e) as being anticipated by Bekiaris et al. (US Pub. 2003/0119307 A1).

In re claim 1, Bekiaris et al. shows (fig. 5C) a semiconductor device comprising; a semiconductor substrate (50) a film stack (110 and 120) formed on the semiconductor substrate and including a film to be processed (116), a dual hard mask (120) comprising an amorphous carbon layer (124) and an underlying hard mask layer (122) interposed between the amorphous carbon layer and the film to be processed, said hard mask layer not including an amorphous carbon layer [0037-0039 and 0054]; and a damascene structure [0036] for a metal interconnect formed in the film stack.

In re claim 2, Bekiaris discloses that said amorphous carbon layer comprises a part of a lithographic structure during the formation of said metal interconnect in said film stack [0043].

In re claim 11, Bekiaris discloses [0039] that said amorphous carbon layer comprises at least one of chemical vapor deposition (CVD) coating, and plasma enhanced CVD coating.

In re claims 13 and 14, Bekiaris discloses [0030] that said damascene structure is a single damascene structure or a dual damascene structure.

In re claim 15, Bekiaris discloses [0036] that said film to be processed (116) comprises a low-k dielectric layer.

In re claims 16-19, Bekiaris discloses that said hard mask layer [0037, 0038, 0054] comprises silicon nitride, carbide, or oxycarbide.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3-10 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bekiaris et al. (US Pub. 2003/0119307 A1) as applied to claim 1 above, and further in view of the cited case law.

In re claims 3 and 4, concerning the limitations of the amorphous carbon layer comprising a CMP stop layer or an anti-reflective coating, such limitations constitute an intended use. It has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. Ex Parte Masham, 2 USPQ F. 2d 1647 (1987).

In re claims 5 and 12, concerning the amorphous carbon layer being configured to have optical properties and control of a critical dimension, it has been held that the recitation that an element is "configured to" perform a function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense. In re Hutchison, 69 USPQ 138.

In re claims 6 and 9, concerning the amorphous carbon layer having the listed optical properties, the amorphous carbon layer of Bekiaris inherently has the optical

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property of an index of refraction and an extinction coefficient since the materials and structure are the same as the instant invention.

In re claims 7, 8, and 10, Bekiaris does not specifically disclose the index of refraction or the extinction coefficient within the desired range, however, it would have been obvious to one of ordinary skill in the art to make the index of refraction or extinction coefficient within the desired range, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Watatani (US Pub. 2004/0082173 A1) also shows a film stack for damascene processing having an amorphous carbon layer.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew E. Warren whose telephone number is (571) 272-1737. The examiner can normally be reached on Mon-Thur and alternating Fri 9:00-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (571) 272-1664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MEW

July 29, 2005

  
TOM THOMAS  
SUPERVISORY PATENT EXAMINER